

QUIZ 10

Select all valid statements about names and addresses.

- ☒ a. **Mapping of names to addresses is stored in the Domain Name System (DNS), a distributed database that can be contacted through DNS servers.**
- ☐ b. URLs (e.g. `http://www.google.es`) contain addresses.
- ☒ c. **URLs (e.g. `http://www.google.com`) contain names.**
- ☒ d. **Names provide easier-to-remember ways to reach networking interfaces.**
- ☐ e. Mapping of names to addresses is stored locally by every device connected to the Internet.
- ☐ f. Names and addresses are equivalent ways to identify network interfaces in the Internet, and can be used indistinctly.

IP addresses are numbers (e.g. 129.104.125.20 or `fe80::1c3c:a2d4:600a:e2df`). What do these numbers identify?

- ☐ a. A request/connection in the Internet, like the ticket id in a serving queue.
- ☐ b. A pair of devices that communicate through the same network link (prefix).
- ☒ c. **A point of attachment in the Internet, i.e. the logical "position" of a networking interface in the network, like a sort of GPS coordinates for the Internet.**
- ☐ d. It's a physical identification of a piece of hardware (machine, laptop, etc.) connected to a network: like the serial number of a device, or like your telephone number.

What does DHCP, mean and what can you use it for?

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

- ☒ **a. DHCP can be used to obtain the address of one or more valid DNS server(s). This way, the requesting device can contact these servers to translate names into IP addresses.**
- ☐ b. DHCP can be used to configure a switch inside a network, so that traffic is forwarded over the available ports to reach its intended destination.
- ☐ c. DHCP stands for Domain-Hop Control Protocol.
- ☒ **d. DHCP can be used to obtain a default gateway, so that the requesting device knows where to send packets, when there no specific routes match the destination of these packets.**
- ☐ e. DHCP can be used to request an Internet route to a given destination.
- ☐ f. DHCP can be used to obtain the IP address of a given domain name (e.g. www.facebook.com).
- ☐ g. DHCP stands for Destination-Hop Control Protocol.
- ☒ **h. DHCP can be used to request and obtain an IP address, from the available pool of IP addresses at the DHCP server, so that the requesting device has a valid connection to the Internet.**
- ☒ **i. DHCP stands for Dynamic Host Configuration Protocol.**
- ☐ j. DHCP can be used to request a next-hop towards a given destination d, so that the requesting device can forward accordingly a packet addressed to d.

What are the differences between a client and a server?

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

- ☐ a. None of the other options is correct.
- ☒ b. **A server accepts or declines connection establishment from a client.**
- ☐ c. After connection establishment, only server is allowed to transmit data to the client.
- ☐ d. Only a server can terminate an established connection.
- ☒ e. **A client starts communication by requesting connection to a server.**
- ☒ f. **There is no difference between client and server after connection has been established.**
- ☐ g. Only a client can terminate an established connection.

QUIZ 20

The C language is not case sensitive.

Select one:

- ☐ True
- ☒ False

A situation where the function fails to deallocate dynamically allocated memory is known as a memory leak.

Select one:

- ☒ True
- ☐ False

Within a function in C, there can be only a single return statement.

Select one:

- ☐ True
- ☒ False

What will be the output of the program?

```
#include<stdio.h>
int main()
{
    int a = 500, b = 100, c;
    if(!a >= 400)
        b = 300;
    c = 200;
    printf("b = %d c = %d\n", b, c);
    return 0;
}
```

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. Blockchain!
- ☐ b. Runtime error
- ☒ c. **b = 100 c = 200**
- ☐ d. b = 300 c = garbage
- ☐ e. b = 100 c = garbage
- ☐ f. b = 300 c = 200
- ☐ g. Compilation Error

Within a while-loop, which statement -- inserted on the indicated place -- will bypass the remainder of the statements in the current iteration, as well as all future iterations, of the for-loop?

```
#include<stdio.h>

int i = 0;

int main() {
    while(i< 10){
        if (i == 5){
            // MAGIC WORD HERE
        }
        printf ("%d\n", i);
        i++;
    }
}
```

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. goto
- ☐ b. halt
- ☐ c. next
- ☐ d. Blockchain!
- ☒ e. **break**
- ☐ f. onwards
- ☐ g. continue
- ☐ h. resume

Assuming that a short is 2 octets wide, what will be the output of this program?

```
#include<stdio.h>

int main() {
    short i = 0;
    for (i=0 ; i++; ){
        printf("Hello World\n");
    }
}
```

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. Blockchain!
- ☐ b. 1, 2, ..., ∞
- ☐ c. Compilation error
- ☐ d. 32767 times ("Hello World" followed by a newline.) -- then the program will throw a run-time error
- ☐ e. A single "Hello World", followed by a newline -- then the program will terminate
- ☐ f. 32767 times ("Hello World" followed by a newline.) -- then the program will terminate
- ☐ g. 65535 times ("Hello World" followed by a newline.) -- then the program will throw a run-time error
- ☐ h. 65535 times ("Hello World" followed by a newline.) -- then the program will terminate
- ☐ i. Infinitely many ("Hello World" followed by a newline.)
- ☒ j. **No output**

What will be the output of this program?

```
#include <stdio.h>

void main()
{
    int x = 5;
    if (x < 1)
        printf("hello");
    if (x == 5)
        printf("hi");
    else
        printf("no");
}
```

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. Compilation Error
- ☒ **b. hi**
- ☐ c. Runtime error
- ☐ d. Blockchain!
- ☐ e. No output is generated
- ☐ f. hello
- ☐ g. no

Assuming that on a given platform, and int is 64 bits wide. What output does execution of the program below yield:

```
#include<stdio.h>

int main() {
    char *ptr = "helloworld";
    printf("%s", &*ptr+5);
    return 0;
}
```

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. hellow
- ☐ b. A compiler error occurs
- ☐ c. Blockchain!
- ☐ d. None of the other options is correct.
- ☐ e. The memory address of p is printed (of the format, but not value, 0x12354123)
- ☐ f. helloworld
- ☒ **g. world**
- ☐ h. Execution terminates without printing anything on the screen.
- ☐ i. hell
- ☐ j. Execution yields a runtime error

Suppose that x is a one dimensional array, and n is an integer -- and then choose the correct statement from among those below.

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

- ☐ a. $*(x + n)$ is same as $x[n] + 1$
- ☐ b. $*\&x[n]$ is same as $x + n$
- ☒ c. **None of the other options applies.**
- ☐ d. $*(x + n)$ is same as $*x[n]$
- ☐ e. $*(x + n)$ is same as $\&x[n]$

QUIZ 30

Order the sequence of steps in the lifetime of a (TCP) connection:

1. The server listens to a port (function listen() in C, constructor ServerSocket() in Java)
2. The client connects to the server on a particular port (function connect() in C, constructor Socket() in Java)
3. The server accepts client's connection (accept() in Java and C)
4. Client and server negotiate the connection parameters in the hand-shake
5. Transit data back and forth (read and write operations in client and server)
6. Connection is closed (close() in C and Java)

Match each property/characteristic with the right layer/protocol.

Provides ordering, i.e., bytes are received in the same order as they were transmitted.

Answer 1

Transport layer / TCP

Connectionless, i.e. no hand-shake is needed to exchange data.

Answer 2

Transport layer / UDP

Best-effort: packets can be reordered and lost.

Answer 3

Network layer / IPv4 and IPv6

Connection-oriented, i.e. the connection has to be established and negotiated between both participants (through a hand-shake) before starting data exchange.

Answer 4

Transport layer / TCP

Provides reliability, i.e., transmitted bytes are acknowledged upon reception, retransmitted otherwise.

Answer 5

Transport layer / TCP

Provides integrity, i.e., the receiver has means to check whether received data is corrupted (for instance, by way of checksums).

Answer 6

Network layer / IPv4 and IPv6

Which of the following statements are correct?

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☒ a. **Unicast and anycast describe communication between exactly one sender, and exactly one recipient. In unicast, sender and recipient are uniquely identified. In anycast, the sender is uniquely identified, but the recipient is chosen from an unknown set of candidates.**
- ☐ b. Anycast corresponds to communication between a set of senders and a set of recipients.
- ☐ c. Unicast corresponds to communication between exactly one sender, and exactly one recipient. Anycast is sometimes used as a synonym for Unicast.
- ☒ d. **Multicast corresponds to communication between one sender, and a set of recipients. Recipients are named, but "unknown" to the sender.**
- ☐ e. Multicast corresponds to communication between a set (one or more) senders, and one common recipient. Senders are named, but "unknown" to the recipient.

Select all correct statements about "Socket Communications".

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☐ a. Two networking interfaces connected through the Internet always use the same socket to communicate.
- ☐ b. A socket corresponds to a networking interface in the Internet, identified by its L2 or L3 address.
- ☐ c. All connections from a given networking interface share the same socket.
- ☒ d. **A connection is uniquely identified by a pair of sockets.**
- ☐ e. A socket is described as a tuple (IPaddr,port), where IPaddr is a network (L3, e.g. IP) address of an interface and the port identifies the process that handles the communication in the corresponding device.
- ☒ f. **A socket is a communication endpoint.**
- ☐ g. A pair of networking interfaces always communicate through the same connection, i.e. the same pair of sockets.
- ☒ h. **Multiple (different) connections can exist between the same pair of networking interfaces (hosts).**

What is a socket? (Select all that apply)

Select one or more:

- ☐ a. A process running in a device connected to a network
- ☒ b. **An endpoint in a network communication**
- ☒ c. **A pair (IP address, port)**
- ☐ d. A network communication

In the class, two transport protocols were mentioned: TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). Other transport protocols exist: SCTP, DCCP, etc. In the TCP/IP model, the transport layer is responsible for maintaining end-to-end communication between two devices in a network.

Is it possible for a distributed application to send information (data packets), from a source to a destination, through a TCP/IP network without using **any** transport protocol?

Select one:

- ☒ True
- ☐ False

In the class, two transport protocols were mentioned: TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). TCP provides reliable transport of packets, meaning, among other things, that it provides retransmissions if packets are lost, and ensures that data arrives to the destination in the same order in which they were sent by the source. UDP, in contrast, does not provide any of these services, meaning that packets sent through UDP may be lost, or received in the wrong order; UDP does not allow the endpoints to notice whether this happens.

In these conditions, why would anyone use UDP instead of TCP?

Select one:

- ☒ a. **In some applications, reordering or loss of some packets is not critical -- and/or, can be handled through mechanisms at the application layer itself. An example of this is live video streaming, in which loss of a particular video frame is less important than on-time reception of frames that actually arrive to destination. TCP provides reliability, but this comes at a cost (connection establishment, receiver acknowledgements, retransmissions, etc., in particular leading to possibly higher latency) that is not worth in some cases.**
- ☐ b. There is no good reason. UDP was developed first historically and is maintained for backwards compatibility, but is now obsolete due to the existence of TCP and other reliable protocols.
- ☐ c. UDP is provided as a "fallback" for TCP: it should be used when at least one of the two devices involved in communication are not able to support the mechanisms and state necessary to support a TCP connection.
- ☐ d. The use of UDP is only advisable for communications within networks in which packets are not lost and order of transmission is preserved in the arrival (for instance, when lower layer protocols provide these services).
- ☐ e. No reason. No meaningful communication can be established if packets can be lost or reordered without the source and/or the destination noticing.

QUIZ 31

Select from among the statements below all those that are true when, in C, a socket is created using this statement:

```
int socket_desc = socket(AF_INET , SOCK_STREAM , 0);
```

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

- ☒ a. It creates an interface that the local program uses when communicating.
- ☐ b. It establishes a TCP connection between a client and a server
- ☐ c. If used in a server, it specifies from which client data can be received.
- ☐ d. Blockchain!
- ☐ e. None of the other options.
- ☐ f. If used in a client, it specifies to which server data will be sent.

```
#include <sys/socket.h>
#include <sys/types.h>
#include <netinet/in.h>
#include <netdb.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <arpa/inet.h>
int main(void){
    char* msg = "Hello World\n";
    struct sockaddr_in serverAddr;
    serverAddr.sin_family = AF_INET;
    serverAddr.sin_port = htons(5000);
    serverAddr.sin_addr.s_addr = htonl(INADDR_ANY);
    int sockid = socket(AF_INET, SOCK_STREAM, 0);
    int b = bind(sockid, (struct sockaddr*)&serverAddr, sizeof(serverAddr));
    int r = listen(sockid,10);
    int s = accept(r,(struct sockaddr*)NULL ,NULL);
    int t = send(s, msg, strlen(msg), 0);
    printf("sent %d bytes out of %lu",t,strlen(msg));
    return 0;
}
```

And select from among the statements below, those which are correct.

- ☐ a. The program may accidentally work, but to be pedantically correct these two lines:

```
int s = accept(r,(struct sockaddr*)NULL ,NULL);
int t = send(s, msg, strlen(msg), 0);
```

which should instead be:

```
int s = accept(sockid,(struct sockaddr*)NULL ,NULL);
int t = send(s, msg, strlen(msg), 0);
```

- ☐ b. If there's no TCP server running on port 5000 on 127.0.0.1, then the program will halt with an error.
- ☒ c. If there's a TCP server running on port 5000 on 127.0.0.1 then this program will print **sent 12 bytes out of 12 on the screen, when executed.**
- ☐ d. Regardless of if there is a TCP server running on port 5000 on 127.0.0.1, or not, then this program will print **sent 12 bytes out of 12** on the screen, when executed.
- ☐ e. This program is a TCP Client
- ☐ f. This program compiles without errors.
- ☒ g. This program is a TCP Server

Consider this code, which is part of a TCP program.

```
int r = connect(sockid, &peerAddr, addrlen);
```

This code is used by a client, and the return value of this function indicates if connection was successful (0) or not (-1).

Select one:

- ☒ True
☐ False

Consider the following code, which is part of a TCP server program:

```
int r = listen(s, q);
```

The function `listen()` is a non-blocking function, that returns immediately -- with the return value, `r`, containing the status (-1 if an error occurs, 0 if the server henceforth is listening for incoming connections).

Select one:

- ☒ True
☐ False

In the following code, when using TCP:

```
int return = bind(sockid, &addrport, size);
```

The return value (`return`) indicates how many bytes were received.

Select one:

- ☐ True
☒ False

Consider the following line of code, which is part of a program using TCP:

```
int r = accept(sockid, &clientAddr, &addrLen);
```

The function `accept(...)` is used by a server to accept new connections. It is a blocking function call. When the connection is successfully established, and the function returns, the socket `sockid` is now ready to be used for data transfer.

Select one:

- ☒ True
☐ False

QUIZ 32

When writing programs communicating using UDP in C, the `send(...)` function call can be .

To convert a `short` from host byte order to network byte order, you use function.

When writing an UDP Echo client, the order of C networking primitives used will be:
 -> -> -> -
> -> -> -
>

QUIZ 40

What flags shall be passed to the compiler, while **linking** a program using posix threads?

- ☐ a. -lblockchain
- ☒ b. -lpthreads
- ☐ c. -threads
- ☐ d. -lpthread
- ☐ e. -gccthreads

Which header file needs be included for using posix threads in C?

☐

a. posix.h

☒

b. pthread.h

☐

c. blockchain.h

☐

d. pthreads.h

☐

e. p_thread.h

Among the arguments passed to pthread API `pthread_create(...)` the final argument, is.

☐

a. The thread id

☐

b. The attributes of the thread

☐

c. Blockchain!

☐

d. The function, which the thread will execute when started.

☐

e. The name of the thread

☒

f. Data being passed to the thread when started.

QUIZ 50

In a protocol stack, on a computer, incoming packets

travel

upwards



whereas outgoing packets

travel

downwards



in the stack.

When the transport layer protocol UDP decides to

which protocol an incoming message is to be delivered, the header field in the header is inspected.

In a protocol stack, layer 4 is called the:

(Note that selecting an incorrect answer incurs a penalty)

- ☐ a. MAC layer
- ☐ b. Physical Layer
- ☐ c. Network layer
- ☐ d. Ethertype layer
- ☐ e. Blockchain! Layer
- ☐ f. Application layer
- ☐ g. TCP layer
- ☐ h. Hardware layer
- ☐ i. Protocol layer
- ☐ j. Datalink Layer
- ☐ k. Ethernet layer
- ☒ l. **Transport layer**
- ☐ m. None of the other options is correct
- ☐ n. Transcendental layer

In the Internet, identifiers serve to, unambiguously, identify each single resource on the Internet.

Select one:

- ☒ True
- ☐ False

Identifiers are carried in packet footers.

Select one:

- ☐ True
- ☒ False

QUIZ 60

DNS is...

- ☐ a. A system which stores only website domain names
- ☐ b. A system which stores only mappings between names and network numbers
- ☐ c. A system which stores only mappings between names and IP addresses
- ☒ d. **None of the other options is correct.**
- ☐ e. A system which stores only mappings between names and blockchains!

DNS can be used for:

Select one or more:

- ☐ a. Blockchain!
- ☒ b. Alias resolution.
- ☒ c. Address to name translation.
- ☒ d. Name to address translation.
- ☒ e. Anything that involves matching names and records
- ☒ f. Resource sharing.
- ☒ g. Load-balancing.

QUIZ 61

In the DNS namespace tree, a FQDN is:

Select one:

- ☐ a. any subtree in the tree.
- ☐ b. a node in the tree (e.g. polytechnique).
- ☒ c. **a leaf in the tree, and all the upper nodes towards the root, with traversed edges corresponding to dots (.) connecting node labels (e.g. www.polytechnique.edu).**
- ☐ d. Blockchain!
- ☐ e. A leaf in the tree (e.g. www).

Select all formally valid Fully Qualified Domain Names (FQDNs).

Select one or more:

- ☐ a. Polytechnique
- ☐ b. edu
- ☐ c. polytechnique.edu
- ☒ d. [www.polytechnique.edu.](http://www.polytechnique.edu)
- ☒ e. [mail.polytechnique.edu.](mailto:mail.polytechnique.edu)
- ☐ f. <http://www.polytechnique.edu>
- ☐ g. <http://www.polytechnique.edu:80>
- ☒ h. [www.lix.polytechnique.edu.](http://www.lix.polytechnique.edu)

In the DNS name space, a fully qualified domain name is a sequence of labels, separated by .

The Zone File in an authoritative DNS server, contains resource records for all the names in a given zone.

For example, the zone file for the DNS server to whom example.com is delegated, contains resource records for all names such as [www.example.com.](http://www.example.com), [mail.example.com.](mailto:mail.example.com), and [login.example.com.](http://login.example.com), but not necessarily for names such as [www.office.example.com.](http://www.office.example.com), and [mail.office.example.com.](mailto:mail.office.example.com)

Select one:

- ☒ True
- ☐ False

QUIZ 62

The DNS server, which your computer contacts directly for resolving a name, is a **"Recursive Resolver"**.

Select one:



True



False

Match terms with definitions.

Iterative DNS request The server to which a request is sent replies with the “best answer”, without contacting other DNS servers. It will either answer the request, if such an answer is available at its local cache, or refer to another DNS server that is more likely to prov

Recursive DNS request The servers to which a request is sent will either answer the request, if such an answer is available at its local cache, or query other DNS servers in order to get an answer that can be sent back to the requester.

A(n) resolver returns a final answer to a DNS

lookup (or query) for a name, regardless of if the name is within its own zone or not.

The DNS server software on your computer, which communicates with the DNS system, is called a **"Local DNS Server"**.

Select one:



True



False

QUIZ 63

Which type(s) of resource records indicate that they contain a mail server?

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

☐ a. AAAA

☐ b. A

☐ c. SOA

☐ d. TXT

☐ e. NS

☐ f. CNAME

☒ g. **MX**

☐ h. Blockchain

☐ i. PTR

In DNS, a name, e.g., www.example.com maps to a single resource record of a given type (e.g., A, AAAA)

Select one:

☐ True

☒ False

QUIZ 64

In the DNS system, root servers...

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☐ a. cannot be contacted by DNS caches from hosts
- ☒ b. are hundreds of physical servers, that replicate 13 logical servers or "named authorities" ("a" to "m")
- ☐ c. resolve authoritatively to any DNS request they receive
- ☒ d. know (or, knows someone who knows) who is maintaining records for any given domain
- ☐ e. are 13 physical servers around the world ("a" to "m")
- ☐ f. receive and resolve all requests coming from lower-level DNS servers
- ☐ g. operate independently one from another, on their own authority zone
- ☒ h. must be synchronized with each other

Select all correct sentences about authoritative servers.

- ☒ a. The authoritative name server for a domain name provides answers to DNS queries involving this domain.
- ☐ b. There is one and only one authoritative server per domain name.
- ☐ c. Name servers that have been delegated a particular domain are not authoritative for this domain.
- ☒ d. An authoritative name server for a domain is a server able to provide original, non-cached answers to DNS queries about this domain.
- ☐ e. An authoritative name server for a domain contains a complete copy of the domain's information, and in particular, contain a SOA (Start Of Authority) record for this domain.
- ☐ f. All the others are false.

QUIZ 71

Your laptop connects to an IP subnet with prefix 129.104.125.128/25. Select the valid IP addresses that your laptop (its corresponding network interface) could use on that subnet:

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☐ a. 129.104.124.129
- ☐ b. 129.104.125.34
- ☒ c. **129.104.125.231**
- ☒ d. **129.104.125.129**
- ☐ e. 192.168.0.1
- ☒ f. **129.104.125.177**

Consider the following routing table. Where (to which interface) will this router send a packet with destination 10.1.5.65?

Network	Interface	Next Hop
default	e0	10.1.1.2
10.1.1.0 /24	e0	DC
10.1.2.0 /24	e1	DC
10.1.3.0 /25	s0	DC
10.1.4.0 /24	s1	DC
10.1.5.0 /24	e0	10.1.1.2
10.1.5.64 /28	e1	10.1.2.2
10.1.5.64 /29	s0	10.1.3.3
10.1.5.64 /27	s1	10.1.4.4

Select one:

- ☐ a. Nowhere, the packet will be dropped.
- ☐ b. e0
- ☐ c. s1
- ☒ d. s0
- ☐ e. e1

When a packet is received at the networking layer for a given destination, it is...

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☐ a. sent through the default route in the routing table, if one exists.
- ☒ **b. sent through the route in the routing table with “longest match prefix” to the packet destination.**
- ☐ c. sent through the route in the routing table indicating lowest cost.
- ☐ d. dropped if none of the networking interfaces of the machine match the packet destination.
- ☒ **e. sent through the host route in the routing table for which the destination is exactly the packet destination, if one exists.**

QUIZ 80

Hosts A and B are connected as shown in the figure.



The network interfaces of the hosts have the following IP configuration (IP address/prefix-length):

- Host A: 129.104.33.25/8
- Host B: 129.104.33.27/16

Select all valid statements.

Select one or more:

- ☐ a. Communication is only possible from host A to host B, given that netmask of A is larger than B's.
- ☐ b. Communication is only possible from host B to host A, given that netmask of A is larger than B's.
- ☐ c. Host A and host B cannot communicate with each other because they are not on the same link.
- ☐ d. No communication between A and B is possible without routing.
- ☐ e. No communication between A and B is possible until the switching table is manually configured accordingly.
- ☒ f. **Host A and host B can communicate with each other.**
- ☐ g. Host A and host B cannot communicate with each other because their network masks have different lengths.
- ☐ h. None of the others.

Consider two stations **a** and **b**, connected to the same Ethernet network link, that transmit at time **ta** and **tb**, two packets with the same packet duration **td**. Propagation time between **a** and **b** is **tp(a,b)**.

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

- ☒ **a. There is a collision if, for any station in the same link, the transmission from a and b overlap in time.**
- ☐ **b. If td is smaller than twice the propagation time over the whole link, then collisions cannot be detected by a and b.**
- ☐ **c. The probability that both transmissions cause a collision depend on the difference between their transmission times $|ta-tb|$, the duration td , and the propagation time $tp(a,b)$.**
- ☐ **d. The probability that a and/or b detect a collision depend on the difference between their transmission times $|ta-tb|$, the duration td and the propagation time $tp(a,b)$.**
- ☒ **e. If td is bigger than twice the propagation time over the whole link, then any collision will be detected by a and b.**
- ☐ **f. There is a collision if, for a and b, its own transmission overlaps in time with the one from the other station (b and a, respectively).**
- ☐ **g. If td is smaller than twice the propagation time over the whole link, the probability of collision detection by a and b depends on (is inversely proportional to) the propagation time $tp(a,b)$: the closer they are, the more likely is that they detect a collision.**
- ☐ **h. There is no collision if $|ta-tb| > td$.**

Select all examples of datalink (layer 2) technologies/protocols.

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

Select one or more:

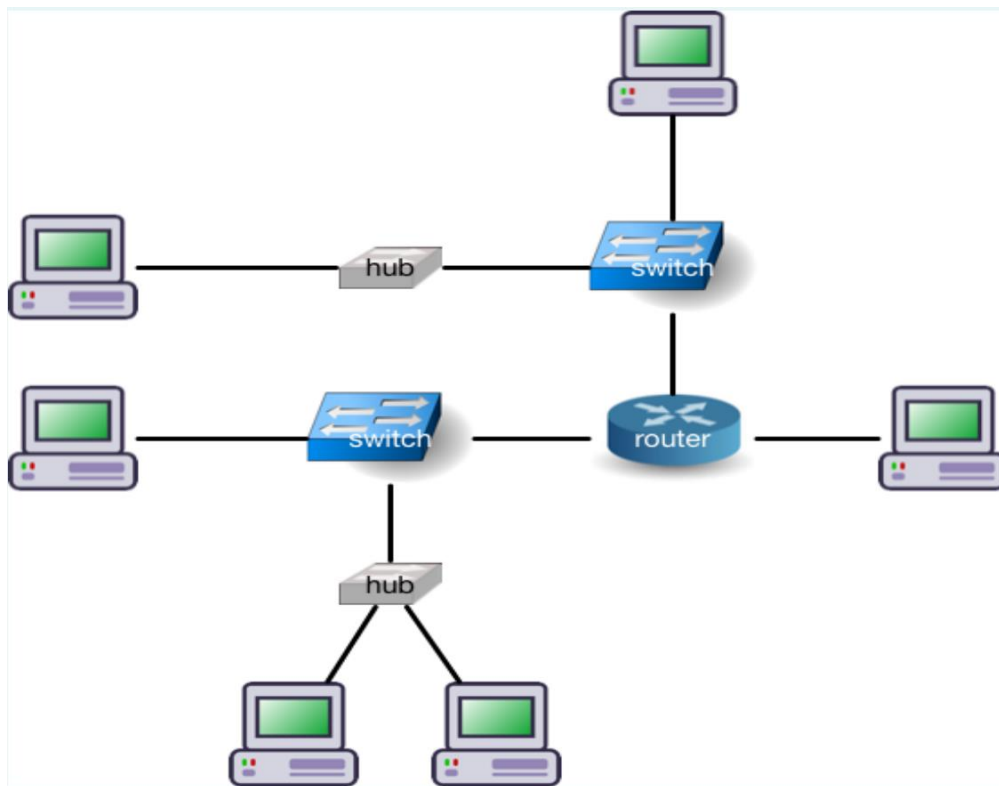
- ☒ **a. Avian carrier.**
- ☒ **b. Ethernet (IEEE 802.3).**
- ☐ c. TCP
- ☒ **d. Token Ring.**
- ☐ e. HTTP.
- ☐ f. DHCP.
- ☒ **g. ATM.**
- ☒ **h. Wi-fi (IEEE 802.11)**
- ☐ i. SSL/TLS.
- ☐ j. None of the above.

This networking device connects network segments together, by overcoming problems related to propagation delays.

(Select all that apply - noting that selecting an incorrect answer incurs a penalty)

- ☐ a. Repeaters.
- ☒ **b. Bridges.**
- ☒ **c. Switches.**
- ☐ d. Hubs.
- ☐ e. None of the others.
- ☐ f. Routers.

How many network links, network segments, broadcast domains and collision domains are in the following topology?



Select one:

- ☒ a. 3 network links (broadcast domains), 7 network segments (collision domains)
- ☐ b. 1 broadcast domain, 3 network links, 7 network segments, 10 collision domains
- ☐ c. 3 network links (collision domains), 7 network segments (broadcast domains)
- ☐ d. 1 network link, 3 broadcast domains, 7 network segments, 10 collision domains
- ☐ e. 1 network link, 3 broadcast domains, 7 collision domains, 10 network segments
- ☐ f. Cannot determine without knowing the configuration of the involved routing and switching tables
- ☐ g. None of the above